

CLAIMS

1. An optical article of final or nearly final dimensions,
consisting of silicon oxide, as such or modified by the
addition of one or more oxides of elements other than
silicon, having an almost complete isotropy and
dimensions equal to or lower than 500 μ m.
2. Process for the preparation of moulds suitable to
manufacture of optical articles or of these very
optical articles, according to the definition of the
preceding claim 1, comprising one or more of the
following operations that, all together, can be
continuously carried out as a fall and/or stopped at
the desired or suitable step:
 - a) preparation of an original high precision mould;
 - b) possible reproduction, in a siliconic rubber or
other suitable compound, of one or more imprints,
having the same sizes and a reversed symmetry with
respect to the moulds obtainable through the
preceding steps;
 - c) preparation, by the employment of one or more of the
products obtained in the preceding steps, of the
optical article having reduced dimensions and
reversed symmetry with respect to the starting
mould/imprint; according to a sol-gel procedure;
 - d) possible preparation, inside the so obtained optical
article, of a further article again having reduced
sizes and reversed symmetry, or of imprints
according to the preceding item b);
 - e) and so on, possibly, through the preparation of
optical articles by sol-gel procedures and/or

imprints according to b), till the desired dimensions or, anyhow, till the lowest dimensions on the ground of the physical limit of the process;

5 f) possible separation, in relation with any step, of the imprint and/or the article obtained in the very step.

3. Process for the preparation of moulds according to the preceding claim in which mould of item a) is produced by a material preferably selected among
10 nickel/phosphorus alloys on aluminum carriers and aluminum alloys.

4. Process for the preparation of the optical article of claim 1 according to claim 2 in which the sol-gel procedure comprises a preliminar step wherein the mould
15 is cool filled with a sol containing the interesting oxide precursors, the sol gelation, the gel drying, the removal of gel from the mould and the final miniaturization of the dried gel.

5. Process for the preparation of an optical article
20 according to the preceding claim in which the mould is previously submitted to surface treatments by means of appropriate antiadhesive agents.

6. Process for the preparation of an optical article according to claim 4 in which the mould is previously
25 filled by a silicon oxide precursor.

7. Process for the preparation of an optical article according to the preceding claim in which the mould is filled also by a precursor of at least an oxide of titanium, germanium, lanthanides and rare earths.